

**SPECIFICATION**

**Attorney Docket No. 10778.00021**

**[01]** TO ALL WHOM IT MAY CONCERN:

**[02]** Be it known that John W. von Holdt, Jr., a citizen of the United States and a resident of Glenview, Illinois has invented certain new and useful improvements in a

**PLASTIC BUCKET AND LID STACKING CONSTRUCTION**

of which the following is a specification.

**CROSS REFERENCE TO RELATED APPLICATION**

**[03]**        This application is a continuation-in-part application of Serial No. 10/404,792 filed April 1, 2003 entitled "Plastic Bucket and Lid Stacking Construction" which is incorporated by reference and for which priority is claimed.

## BACKGROUND OF THE INVENTION

- [04] In a principal aspect the present invention relates to a molded plastic bucket and lid construction wherein the bucket and lid are configured in a manner which promotes effective stacking of buckets with lids for shipment or storage.
- [05] Various types of molded plastic buckets or containers are known. For example, molded plastic buckets are disclosed in the following patents of John W. von Holdt Sr.: U.S. Patents No. 4,275,948; No. 4,574,974; No. 4,512,494; No. 4,512,493; No. 4,452,383; No. 4,380,305; No. 4,308,970; and No. 4,210,258. Buckets or containers disclosed in the aforesaid patents are useful for storage of powder or liquid materials including, paint, solvents and chemicals. The disclosed molded plastic buckets are typically manufactured using injection molding techniques by an entity skilled in the practice of such techniques. The containers or buckets and compatible molded plastic lids are then shipped to entities, which desire to fill the containers with a product. Filled containers with attached lids are then shipped to wholesale distributors and otherwise dispersed throughout various channels of commerce. Typically, the lidded containers are shipped in large or bulk quantities on shipping pallets. When shipped in this manner it is necessary to stack the buckets or containers one upon the other to provide an efficient and economically sized package for transport by pallet.
- [06] An objective associated with such stacking is to provide a means by which the stacked buckets with lids will remain appropriately oriented and stacked one upon the other during shipment. Thus, there has developed a need to provide means by which filled, stacked buckets may be appropriately positioned one on top of another in a stacked condition without tilting, falling or slipping. Further, it is desirable to have such capability for purposes of display of stacked buckets on display counters in retail stores and retail outlets. Thus, the idea of stacking multiple containers or buckets one upon the other for purposes of transportation, shipment or display is a characteristic feature or objective that is much desired.

## SUMMARY OF THE INVENTION

- [07] Briefly, the present invention comprises a molded plastic bucket or container and a compatible lid combination wherein, the bucket and lid are configured in a manner which facilitates the stacking of buckets with lids one upon the other. More particularly the bottom of each bucket is formed with a circumferential or annular groove about its outer periphery. The lid for the container or bucket is provided with a circumferential or annular rim configured and dimensioned in a manner to be received and nested within the groove of the bottom of a bucket stacked thereon. Various dimensional and structural details are associated with the shape, location and dimensions of groove in the bottom of the bucket and the peripheral rim of the lid, which is placed on the top of the bucket, to enable or ensure that stacked buckets will not slip and that the buckets can be effectively and efficiently displayed or stored or packed for shipping.
- [08] Thus, it is an object of the invention to provide an improved combination molded plastic bucket and lid construction which is especially useful for stacking of filled buckets.
- [09] It is a further object of the invention to provide an improved plastic bucket and lid combination useful for stacking of buckets one upon the other without intervening layers of material to ensure that the stack of containers or buckets will remain in an interlocked relationship for shipment or display.
- [10] A further object of the invention is to provide an economical and efficient design useful for the stacking of a bucket upon a lid of a container of a vertically adjacent bucket and lid combination.
- [11] These and other objects, advantages and features of the invention will be set forth in the detailed description which follows.

## **BRIEF DESCRIPTION OF THE DRAWING**

- [12] In the detailed description, which follows, reference will be made to the drawing comprised of the following figures:
- [13] **Figure 1** is a perspective view of a combination bucket and lid made in accord with the invention;
- [14] **Figure 2** is a cross sectional view of the bucket of Figure 1 along the vertical section through the middle axis of the bucket;
- [15] **Figure 3** is an enlarged cross sectional view of the combination lid and bucket with a second bucket stacked upon the lid of the first bucket;
- [16] **Figure 4** is an enlarged cross sectional view of the stacking arrangement of a bucket upon a lid associated with a bucket as depicted in Figure 3;
- [17] **Figure 5** is a cross sectional view of two lids stacked one upon the other;
- [18] **Figure 6** is a cross sectional view of a first alternate embodiment;
- [19] **Figure 7** is a cross sectional view of a second alternate embodiment;
- [20] **Figure 8** is a cross sectional view of a third alternate embodiment; and
- [21] **Figure 9** is a cross sectional view of a fourth alternate embodiment.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

[22] Referring first to Figure 1, a lid 10 comprises a generally planar, molded plastic member having a circular shape and is generally symmetrical about a vertical middle axis 12. The lid 10 is formed to be compatible with, fit upon and remain engaged with a top rim 14 of a bucket 16. The bucket 16 is likewise symmetrical about the vertical middle axis 12. Note, the descriptions herein are made with respect to generally cylindrical containers. However, the invention is not so limited and may be incorporated into containers having various shapes such as polygonal, noncircular shapes.

[23] Bucket 16 is formed by injection molding of a polymeric material and includes a generally cylindrical, circular cross section sidewall 20 and a generally circular bottom wall 18. The bucket 16 further includes an open top 15 with a circular, peripheral top rim 14 that is compatible with the lid 10. The particular configuration or attachment design or element incorporated in rim 14 and lid 10 for affixing the lid 10 to rim 14 is not a limiting feature of the invention. However, the rim 14 typically includes an outwardly extending rib 19 cooperative with inwardly extending tab or flange 17 of lid 10 so that the lid 10 is removably affixed to the bucket or container rim 14.

[24] The subject matter of the invention relates, in part, to the particular configuration of bottom wall 18 of the bucket 16. More specifically, the bottom wall 18 includes an outer or first circumferential lip 24 radially spaced a first radial distance  $R_1$  from the middle line axis 12. A second, outer circumferential radial lip 22 is spaced a distance  $R_2$  from the middle line axis 12 and, in combination with the first rib 22, defines a circumferential or annular groove 26. The outer or first rib 24 extends slightly radially beyond the outside face 28 of the bucket sidewall 20 adjacent bottom wall 18. The ribs 22 and 24 thus define an annular groove or channel 26 in the bottom wall 18. The first and second ribs 22 and 24 are preferably continuous annular rings, but may be intermittent or segmented. A second annular groove 30 is defined in wall 18 inwardly from the second rib 22. The second annular groove 30 contours the uniform thickness, bottom

wall 18 thereby providing a reinforcing feature for the bottom wall 18. Central circular recessed section or panel section 32 of the bottom wall 18 provides a further reinforcing function for the bottom wall 18.

[25] Lid 10 includes a circumferential, annular rib 44 projecting upwardly. Rib 44 is configured to be compatible with the groove 26 in bottom wall 18 of the bucket 16 as defined by the two spaced ribs 22 and 24. Thus, as depicted in Figures 3 and 4, a bucket 16 may be stacked upon the lid 10. That is, the groove 26, formed by the spaced ribs 22 and 24, is dimensioned so that it will receive the rib 44 associated with the lid 10. The cross sectional shape of rib 44 is designed and dimensioned to fit congruently into groove 26. Lid 10 is also designed so that the remainder of outside surface of lid 10 will not prevent engagement of rib 44 into groove 26.

[26] The bottom wall 18 of bucket 16 may be designed so that annular sections 35 and 37 may rest against opposed annular sections 39 and 41 of the lid 10. Thus, an inner annular rib 39 may project from the top surface of lid 10 to support the bottom section 35 of bottom panel 18 of bucket 16 by fitting against bottom wall 18. Preferably only the tongue or rib 44 of lid 10 will fully rest or engage the bucket groove 26.

[27] Functionally, the inside face of the first rib 24 fits against the outside surface or edge of lid rib 44 thereby maintaining a bucket 16 placed on a lid 10 and preventing lateral or side to side movement of the bucket 16 relative to lid 10.

[28] By maintaining the outside rib 24 maximum radius within the maximum radial dimension of the bucket 16 and attached lid 10, (hereinafter the maximum assembly radius) the stacking arrangement of multiple vertically stacked buckets 16 falls within a vertical cylinder defined by the maximum assembly radius. This insures an efficient packaging of vertical stacks of buckets with lids on a pallet.

[29] Variations of the construction may be effected with out departing from the spirit and scope of the invention. For example, the configuration of the bucket 16 and lid 10 need not be

cylindrical. Rectangular container shapes may incorporate the stacking feature of the invention. Also, the first rib 24, as well as the outer edge of lid rib 44, may be discontinuous so long as there is maintained opposed surfaces of lid rib 44 and first bucket rib 24.

[30] Figures 6 – 9 illustrate various alternative embodiments of the invention. Each of the Figures 6 – 9 comprise a cross section illustration depicting the profile of a container and container lid as well as a molded plastic lid support assembly associated with the open top of the container. The support assembly may be integrally incorporated with the top rim or separate from the top rim, yet acting therewith in combination. A first alternative embodiment is depicted in Figure 6. The cross-sectional configuration or profile depicted is typically associated with a cylindrical container. However the type of container is not limiting, for example, it may be rectangular or some other polygonal shape or some other configuration such as an elliptical. Figure 6 and the remaining figures depict the cross-sectional configuration for the bottom of the container as well as the top or lid of the container and the associated elements incorporated with or in combination with the container top and lid. In Figure 6, therefore, a container 70 includes a bottom wall 72 and a lateral side wall 74. The lateral side wall 74 extends downwardly and includes a peripheral, bottom, outside, downwardly depending rim extension 76. The bottom rim extension 76 in the embodiment of Figure 6 is desirably an extension of the wall 74. It is noted that the extension 76 typically extends downwardly beyond all of the elements of the bottom wall 72. That is, if the container 70 is generally cylindrical in shape, then the bottom lid extension 76 is substantially cylindrical and extends vertically downwardly to define an annular ring.

[31] The upper end of the container wall 74 includes an upper rim 78 having an outwardly projecting rib 80. A separate molded plastic lid support assembly 82 is fitted over the top rim 78 and outwardly projecting rib 80 of the wall 74 of lower container 73. The molded plastic lid support assembly 82 includes a peripheral or circumferential, generally horizontal, top planar section 84 and a depending lip 86 sitting on the outside of the rib 80 of wall 74 of the container 70 and thus against the projecting rib 80. The generally horizontal section 84 in combination



with the downwardly depending lip 86 fits against the bottom extension 76 to thereby hold the upper bucket or container 70 in position on the molded lid support assembly 82. In the embodiment depicted, since all of the components are generally symmetrical about a vertical axis 71, the upper container 70 is generally fixed and non-slidable with respect to a lower container 73.

[32] The molded lid support assembly 82 further includes an interior, depending skirt 88 which fits against the inside of the wall 74 and, in combination with the downwardly projecting lip 86, holds the plastic lid support assembly 82 in position on the wall 74. Positioned below the horizontal run 84 and projecting from skirt 88 is a radially inwardly extending, generally horizontal run 90 which extends toward the axis 71 from the middle section of the skirt 88. Fillets or support ribs 92 may be provided to provide for extra rigidity to position and maintain the position of the horizontal run or section 90. The horizontal run or section 90 is connected to a vertically upwardly extending annular run 93 which is spaced from and generally parallel to the skirt 88. The run 93 extends upwardly for a distance that is generally coincident with the upper extent of the wall 74 of container 73.

[33] A separate lid 96, typically a molded, plastic lid, includes a peripheral rim section which is compatible with the lid support assembly 82. Thus the lid 96 includes a horizontal upper end run 98, a downwardly extending medial run 100 with a groove 102 molded in the outer circumferential peripheral surface thereof. The groove 102 is configured to receive the upwardly extending rib 92 of the lid support assembly 82. The downwardly depending run 100 then connects with a generally radially inwardly extending horizontal run 104 which, in turn, connects with an upwardly extending generally vertical run 106 that, in turn, connects with a planar lid cover run or section 108 which is generally horizontal and covers the internal contents of a container.

[34] The described construction thus contemplates utilization of a container 73 in combination with a lid support assembly 82 and a separate lid 96. The lid 96 may be removed from the

combination of the container 73 and support assembly 82. Alternatively, the support assembly 82 and lid 96 may be removed from the container 74.

[35] Figure 7 illustrates another embodiment similar in various respects to the embodiment of Figure 6. That is, a lid 96 is again utilized and configured as described with respect to Figure 6. Additionally, the container 73 is configured and constructed as previously described with respect to Figure 6. However, the lid support assembly 82 is replaced by an alternative assembly 182 wherein the construction of the outer peripheral engaging run 184 is connected with a downwardly depending vertical run 186 having a groove 188 and a retention lip 190 to more easily retain and more rigorously retain the assembly 182 on the container or bucket 73. This construction thus is more likely to be utilized in a manner which will provide for removal of the lid 96 rather than the assembly 182 from the container 73.

[36] Figure 8 illustrates yet another embodiment of the invention wherein lid 96 is again of the same construction and configuration previously discussed. Similarly the bottom rim extension 76 of the upper bucket or upper container 70 is the same. The top construction or rim of the container 70 as well as the container 73 is altered, however. That is, a vertical outside wall 174 extends upwardly in a fixed, straight direction so as to provide a top edge 175 for cooperation with the rim extension 76 to provide for stacking of the containers 70 and 73. A horizontal inwardly extending run 176 extends from the wall 174 and is molded integrally therewith. The inward radially extending horizontal wall 176 is connected to an upwardly extending vertical wall 177, which again cooperates with the groove 102 of the lid 96. With the combination of Figure 8, the lid 96 is removable from the top of the bucket 73. However, molding of the bucket 73 becomes a more challenging effort inasmuch as the inwardly extending wall 176 may necessitate the use of special mold constructions that are not easily removed after the molded product has been formed. Thus, the benefits of the embodiments of Figures 6 and 7 may not all be available for the embodiment of Figure 8.

[37] Figure 9 illustrates yet another embodiment which is more closely linked to the embodiments of Figures 1 – 5. In this embodiment, an outer rim 200 of a bucket 202 extends radially outwardly from the outside wall 204 of the bucket 202. A second inwardly positioned rim member 206 facilitates the generation of a groove 208 which receives a top horizontal run 210 of a lid 212. This provides for the stacking feature previously described. The top rim section of container 214 includes a construction depicted in cross-section for the top room 216 such as shown in U.S. Patent No. 5,913,446 (incorporated herewith by reference) by way of example. The lid 212 then cooperates with the upper rim 218 and includes, in addition to the horizontal run, a depending skirt 220 with a groove 222 for receipt of a rib 224 of the top rim portion 218. The depending skirt 220 may include a tear away feature permitting removal of portions of the groove 222.

[38] Various alternative constructions of the invention are possible. Therefore the invention is to be limited only by the following claims and equivalents thereof.